

Activity #6: Circle and Square Investigation (Student version)

Math

Note to students: Teams of two will work to produce a finished product that will answer and explain the problems posed in this activity.

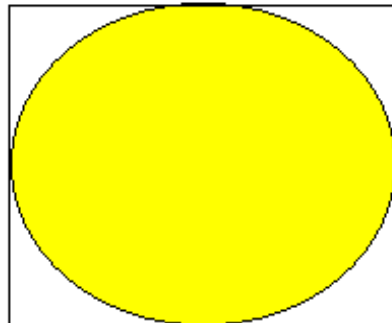
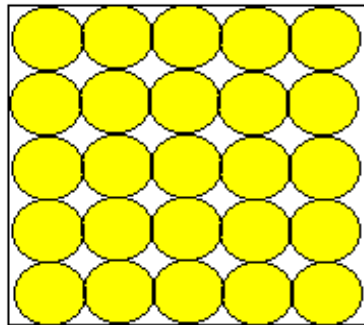


Purpose:

- To organize mathematical thinking
- To investigate area and circumference
- To communicate mathematical reasoning effectively
- To develop suitable problem-solving

Materials: paper, scissors, stopwatch, compass, ruler, thinking cap, calculator and computer (optional)

Activity Explanation: Given the two patterns below on the same sized squares (Note: Circles and squares are all tangent to one another.), you will investigate and report on the following:



You are manufacturing Frisbees and will cut circles from squares for pattern templates. You would like to minimize time and waste as part of your strategy to maximize profit. To do this, you will need to answer the following two questions

1. How much more waste will result from cutting the one big circle than from cutting the all the smaller circles? Remember the two squares are the same size.
2. How much longer will it take to cut the all the smaller circles than the one large circle?

(This activity has been modified from Geometry by Prentice Hall ©1998.)

Activity Procedure:

1. You and your partner must plan steps to answer the first question posed. How will you decide on the waste? What will you need to do? Can math help you answer the question? What particular mathematics do you need? Write your plan below.

Remember it will be okay to change your plan as you begin to actually follow the steps you propose. It is not necessary to use exactly 6 steps. Use as many as necessary to complete the task.

Step 1: _____

Step 2: _____

Step 3: _____

Step 4: _____

Step 5: _____

Step 6: _____

2. Compare your steps with results from other teams. What do you think about your strategy? Do you want to make any changes? If so, amend your plan. Do not erase the original plan.

3. You are now ready to follow your plan. In journal format, record your findings as you complete each step. Write a paragraph with supportive mathematics stating your answer.

Remember that you can change steps at any time. Just be sure to note each change.

4. You and your partner must plan steps to answer the second question posed. How will you decide on the time needed for cutting? What will you need to do? Can math help you answer the question? What particular mathematics do you need? Write your plan below.

Remember it will be okay to change your plan as you begin to actually follow the steps you propose. It is not necessary to use exactly 6 steps. Use as many as necessary to complete the task.

Step 1: _____

Step 2: _____

Step 3: _____

Step 4: _____

Step 5: _____

Step 6: _____

5. Compare your steps with results from other teams. What do you think about your strategy? Do you want to make any changes? If so, amend your plan. Do not erase the original plan.

6. You are now ready to follow your plan. In journal format, record your findings as you complete each step. Write a paragraph, with supportive mathematics, stating your answer.

Analysis and Extension:

Compare your results with results from other teams.

What else would you consider before you went ahead with your Frisbee production?
